

DOCKET NO.: ARCO-25,200; DP 50-06-1641C

PATENT

As stated previously, it is the opinion of Applicant's attorney that the subject application claims the same invention as the '590 Patent and that there is a basis upon which Applicant is entitled to judgment relative to the patentee.

In further support of this opinion, a claim chart has been attached which refers to support for the copied claims in Applicant's specification. The chart shows the supporting material by reference to U.S. Patent 5,961,279 which is the parent of the subject application, and includes the same material in its specification. It is believed clear that all of the copied claims find support in Applicant's specification, except for small obvious differences which are primarily differences in phraseology.

Please amend the previously proposed count to read as follows.

#### COUNT

A gas turbine engine[, the] having a first component having at least one knife edge seal for inhibiting air leakage through an intercomponent gap between the first component and [the] a second component, the first component characterized by:

a brush seal mounted on the first component in [series] tandem with the knife edge seal, the bristles of the brush seal extending toward the second component for impeding the leakage of air through the [inner] inter-component gap.

This proposed Count is substantially Claim 1 of the '590 Patent, restated to cover gas turbine components generally, rather than only refurbished gas turbine components.

It is considered that Applicant's Claim 32 corresponds to this count which has been changed from Claim 32 only to eliminate the requirement for a refurbished gas turbine engine component since the brush seal is also useable with new turbine installations.

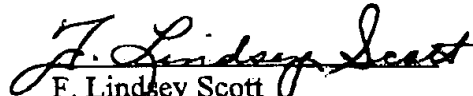
Applicant submits that the invention claimed in the '590 Patent is the same invention claimed in the subject application.

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Accordingly, it is believed that all claims now included in this application are in condition for allowance and it is respectfully requested that the Examiner determine that an interference should be declared and that the Examiner prepare and forward interference papers to the Board, as provided in 37 CFR 1.609.

Respectfully submitted,

  
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**CLAIM CHART**  
**U.S. PATENT 5,630,590 / USSN 09/288,943**

3/96 United Tech

5/96

inventor

USP 5,630,590	USSN 09/288,943 (USP 5,961,279)
<p>112.1st → 1. <u>A refurbished</u> gas turbine engine component having at least one knife edge seal for inhibiting air leakage through an intercomponent gap between the component and a second component, the refurbished component characterized by:</p> <p style="padding-left: 40px;">a brush seal mounted on the refurbished component in tandem with the knife edge seal, the bristles of the brush seal extending toward the second component for impeding the leakage of air through the intercomponent gap.</p>	<p>FIG. 1 &amp; FIG. 2 Col. 1, line 66 - Col. 2, line 24 ✓ Col. 4, line 6-27 Col. 5, line 8 - Col. 6, line 8</p>
<p>2. The refurbished component of claim 1 characterized in that the component comprises two component segments, the brush seal is also segmented and the brush seal segments are mounted in a circumferentially extending groove so that the seal is installable and removable by separating the component segments and sliding the brush seal segments circumferentially in the groove.</p>	<p>FIG. 1 &amp; FIG. 2 Col. 1, line 66 - Col. 2, line 24 Col. 4, line 6-37 Col. 5, line 8 - Col. 6, line 8 Col. 5, line 19-26 Col. 6, line 6-7</p>

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<p>3. A method of improving the air sealing effectiveness between a rotating component and a nonrotating component in a turbine engine, the rotating and nonrotating components being separated by a gap with knife edge seals extending across the gap to inhibit leakage of air therethrough, the method characterized by:</p> <p>providing a brush seal;</p> <p>reconfiguring the nonrotating component to provide means for receiving and retaining the brush seal in tandem with the knife edge seals; and</p> <p>installing the brush seal so that the seal bristles extend toward the rotating component to impede the flow of air through the gap, the brush seal being retained by the receiving and retaining means.</p>	<p>FIG. 1 &amp; FIG. 2</p> <p>Col. 1, line 66 - Col. 2, line 24</p> <p>Col. 4, line 6-27</p> <p>Col. 5, line 8 - Col. 6, line 8</p>
<p>4. The method of claim 3 wherein the nonrotating component is hollow and substantially cylindrical and has a wall thickness and a face, the method characterized in that the step of reconfiguring the nonrotating component includes:</p> <p>creating a capture slot in the face of the nonrotating component for radially retaining the brush seal; and</p> <p>attaching a retainer to the nonrotating component so that the retainer cooperates with the face to axially trap the brush seal.</p>	<p>FIG. 1 &amp; FIG. 2</p> <p>Col. 1, line 66 - Col. 2, line 24</p> <p>Col. 4, line 6-27</p> <p>Col. 5, line 8 - Col. 6, line 8</p> <p>Col. 4, lines 6-27</p> <p>Col. 5, line 19-26</p> <p>Col. 5, line 66 - Col. 7, line 8</p>
<p>5. The method of claim 4 characterized in that the reconfiguring step includes reducing the wall thickness by a predefined amount in the vicinity of the face to form a seal seat and accommodate the radial dimension of the brush seal.</p>	<p>FIG. 1 &amp; FIG. 2</p> <p>Col. 1, line 66 - Col. 2, line 24</p> <p>Col. 4, line 6-27</p> <p>Col. 5, line 8 - Col. 6, line 8</p> <p>Col. 5, line 19-26</p> <p>FIG. 4 &amp; FIG. 5</p> <p>Col. 5, line 8-26</p>

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6. The method of claim 4 characterized in that the reconfiguring step regulates the axial length of the nonrotating component.	FIG. 1 & FIG. 2 Col. 1, line 66 - Col. 2, line 24 Col. 4, line 6-27 Col. 5, line 8 - Col. 6, line 8 Col. 5, line 19-26 FIG. 4 & FIG. 5 re dimension C before and after brush seal installation.
7. The method of claim 3 wherein the brush seal is a multilayered brush seal.	Obvious variation
8. The method of claim 3 wherein the nonrotating component comprises upper and lower component segments each component segment subtending approximately 180 degrees of arc, the retainer also comprises upper and lower retainer segments, each retainer segment subtending approximately 180 degrees of arc, and the brush seal comprises an upper brush seal segment subtending approximately 180 degrees of arc and one or more lower brush seal segments, the lower brush seal segments collectively subtending approximately 180 degrees of arc.	FIG. 1 & FIG. 2 Col. 1, line 66 - Col. 2, line 24 Col. 4, line 6-38 Col. 5, line 8 - Col. 6, line 8

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<p>9. A method of improving the air sealing effectiveness between a rotating component and a nonrotating component in a turbine engine, the nonrotating component being hollow and substantially cylindrical and having a wall thickness and a face, the rotating and nonrotating components being separated by a gap with knife edge seals extending across the gap to inhibit leakage of air therethrough, the method characterized by:</p> <ul style="list-style-type: none"><li>reconfiguring the nonrotating component by reducing its axial length by a predetermined amount and reducing its wall thickness in the vicinity of the face by a predefined amount whereby a seal seat is formed;</li><li>creating an axially and circumferentially extending capture slot in the face of the nonrotating component;</li><li>attaching a retainer to the face so that the retainer cooperates with the face and the seal seat to define a circumferentially extending groove; and</li><li>installing a brush seal in the groove so that the bristles of the seal extend toward the rotating component to impede the flow of air through the gap;</li><li>the brush seal being radially retained by the capture slot and the seal seat and axially retained by the retaining ring and the face.</li></ul>	<p>FIG. 1 &amp; FIG. 2 Col. 1, line 66 - Col. 2, line 24 Col. 4, line 6-27 Col. 5, line 8 - Col. 6, line 8 Col. 5, line 19-26 FIG. 4 &amp; FIG. 5 re dimension C before and after brush seal installation. Col. 2, line 15-20 Col. 5, line 19-26</p>